

Mobile-Based Research Methods

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INTRODUCTION

The Internet-enabled mobile handset has rapidly achieved worldwide penetration. Combining personal telephony and sophisticated technologies, the mobile Internet has opened new opportunities for offering a diverse range of services, including online surveys. In particular, the mobile-based messaging service can be used as a practical tool for transmitting questionnaires and collecting responses (see Figure 1). This method also offers a solution to researchers who have begun to recognize that an important question remains unanswered in mobile research: How can we actually “capture” mobile Internet users? So far, the majority of empirical studies in this area have used the traditional pen-and-pencil survey method, while little care has been taken to ensure that the respondents are actual mobile Internet adopters who are capable of evaluating such a new medium. Because of the ubiquitous nature of the mobile device, a conventional questionnaire may be inappropriate for capturing “true” targets, and unlike PC-based e-commerce research, there are several factors to be considered in terms of survey planning and executions.

The aim of this article is to propose a framework of mobile-based survey methodology. Specifically, we attempt to establish guidelines for a questionnaire survey via the mobile device, in terms of cost, questionnaire format, incentives, target respondents, response rate, and data quality.

CRITICAL ISSUES TO BE CONSIDERED

Cost

Prior research indicates that the total cost of Internet-based surveys requires a higher set-up cost in designing, programming, and hosting sites, in comparison with paper-based surveys. However, Internet-based surveys demand neither paper nor postage, thus reducing overall costs by 30-60% (Hanna, Weinberg, Dant, & Berger, 2005). Furthermore, typical online surveys require no expenses related to photo-

copying, clerical support, and data entry, since the responses can be input into the data analysis software automatically (Llieva, Baron, & Healey, 2002).

While similar benefits can be expected from mobile-based surveys, the wireless device requires a higher connection cost in data collection. This is particularly an issue, because although mobile penetration has been growing worldwide, Internet connection capacity still varies between countries in terms of both infrastructure and handset functionality. For example, SMS seems comparable to the Japanese e-mail service in terms of cross-carrier compatible, text-based, and immediate send-and-deliver, but the simple SMTP-based mail used by DoCoMo, KDDI, and Vodafone offers more practical advantages. With regard to pricing, Scuka (2003) notes:

It costs 0.3 yen to send 1 packet on DoCoMo's 2.5G i-mode network in Japan; 1 packet is 128 bytes, so a typical simple e-mail might only cost 1 yen (and even cheaper on 3G, where the average packet price is around 0.06 yen/packet). SMS messages, in contrast, cost 19 Euro cents to send 160 characters on all four carriers in Germany (T-Mobile, Vodafone, E-Plus, and O2).

Response Format

The choice of response format is another important question. Here, two basic issues must be considered: (1) dichotomous vs. multichotomous scale formats, and (2) the wording of the response scale points (Netemeyer, Bearden, & Sharma, 2004). Dichotomous scales have practical advantages, in that they take less time for a respondent to fill in and, therefore, allow more items to be responded to in a short time. However, they have been criticized for their tendency to have highly unbalanced response distributions—that is, all individuals always answering “true” or all individuals always answering “false” (Comrey, 1988). Furthermore, any one item for a dichotomous scale produces only limited covariance with any other item because of the binary format, and overall scale variance will be very limited. Multichotomous scales overcome these shortcomings, in that they create more

Figure 1. Example of mobile-based online questionnaire (Source: D2 Communications). An English translation is shown on the right side.

How often do you read magazines?

☐ Not at all
☐ Once a month
☐ 2-3 a month
☐ Once a week
☐ 2-3 a week
☐ 4-5 a week
☐ Everyday

Go next

scale variance relative to a dichotomous scale with a similar number of items.

For these reasons, academic researchers tend to prefer multichotomous formats, while practitioners are more likely to adopt dichotomous formats. For example, our depth-interview with an agency practitioner reveals that the reason for the exclusive use of dichotomous response format was its ease of use and minimum response time, which agencies believe are closely related to data quality (Fukada, 2005).

Type of Incentives

In general, it is agreed that the use of monetary incentives has positive effects in increasing the response rate, in both online and off-line surveys (Church, 1993; Yammarino, Skinner, & Childers, 1991). However, what “type” of incentives could increase the response rate seems unclear. For example, Ray, Griggs, and Tabor (2001) found that as much as 57% of the respondents agreed to an exchange for a draw/raffle inclusion, while Comley (2000) reports that such an incentive has little impact in e-mail surveys. A recent experimental study shows that a shorter questionnaire with small lotteries with higher winning chances would produce a higher response rate, but a longer questionnaire also could generate a reasonable response rate if vouchers were promised (Deutskens et al., 2004).

In the case of a mobile-based survey, a barcode coupon has been widely used in various cases of push marketing

(Senden Kaigi, 2004). Furthermore, a free download of screen images, ring-tones, online games, product samples, electronic coupons, and a sweepstakes competition have been tested as effective incentives to encourage participation (Senden Kaigi, 2004). In particular, the free content download (in particular, ring-tone and screen image) and sweepstakes competition offer practical and economical solutions, given that they represent two of the most popular mobile Internet usages in many markets (Dano, 2002; Kim et al., 2004; Harris, Rettie, & Kwan, 2005).

Target Respondents

One of the major problems in m-commerce research is that researchers are often unable to ensure whether target consumers actually have sufficient experience and are capable of providing reliable responses. Empirical studies that used “general” consumer samples seldom conditioned their experience in accessing the mobile Internet, and did not ensure that the target respondents had actually adopted the mobile device for Internet connection. Also, we need to cover a wider range of consumer groups, in both demographic and socioeconomic characteristics. In particular, in an m-commerce context, it is extremely important that the survey examine those who regularly access the mobile Internet, read promotional messages, and even access the linked sites to obtain further information, on a daily basis (Okazaki, 2005). This clearly relates to the respondents’ perceived ability to use the mobile Internet, because mobile-based questionnaires can only be returned from those who are willing to reply via mobile device. This is significantly different from PC-based online surveys, where researchers can offer alternative response options such as fax or postal mail (Truell, 2003).

Response Rate

The response rate of surveys has often been used to assess data quality (Shermis & Lombard, 1999). According to Comley (2000), the overall response rate of all virtual surveys in 1999 ranged from 15% to 29%. However, considerable discrepancies have been found between similar studies in similar periods (Ray et al., 2001; Virtual Surveys, 2001; Wygant & Lindorf, 1999). In many cases, the response rate was found to depend upon the researched topic, which may or may not encourage active participation (Sheehan & McMillan, 1999; Ray et al., 2001).

These figures have an important implication for the computation method of response rate, since a mobile-based questionnaire is normally sent via a push messaging service to the “opt-in” users. Therefore, the target base is a total population of a given area, and whether recipients actually click and open the questionnaire is crucial. At the same

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